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Information Systems Success Factors In China

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Introduction

Predicted to be the world's largest economy in the 21st century, China has captured attentions from around the globe because of its size, growth potential, and impact on the global market. China's population, consisting of a quarter of the world's population, makes up unarguably the most important target market of many of the U.S., European, and Asian multinational corporations. Not only is it a huge market, it is also a fast growing market. China's economy has been growing at an exception rate, more than 10% annually since 1992, whereas, the U.S., 2.3% (CIA, 1997). In addition, China's impact on other countries is unprecedented. For example, the trading deficit between the US and China has been consistently increasing for the past ten years; it has grown from \$ 0.3 billion in 1985 to 42 billion in 1996 (CIA, 1997). This demonstrates the growing dependency of the U.S. on China.

Obviously, a study of China is important. The development of information systems in China is a recent event that started around 1993. Most major development took place in the last two to three years. Numerous MIS-related management and control problems and issues accompany the recent explosive development of information systems in China. There needs to be some guidance for the development of IT/IS in China.

The literature review indicates that research concerning China in the area of MIS is limited. The majority is practitioner-oriented and neglects the management aspect of IS. Many focus on narrow domains, for example, hardware or software. Some aim on specific types of organizations, such as state-owned enterprises (i.e. Dologite, Fang, Chen, Mockler and Chao, 1997). No research has attempted to portray all aspects of information systems development of China.

There are two main purposes of this study. First purpose is to depict the factors that affect the development of IT in China. Second, it is to propose a list of critical success factors pertaining to the current and future success of IT development in China. Those factors are mainly at country and industry level. Finally, some suggestions and implications are presented to researchers, Chinese policy makers, domestic companies, and foreign companies.

Driving Factors of IT Development

The study identified a set of environmental factors at the macro-level. Those factors are China's unique economic, political, cultural environment, and technological status. A major foundation of the factors is the model proposed by Palvia and Palvia (1991). The model, proposed for global IT research, indicates that the level of economic growth, national culture, and political system and government policies have significant impact on IS development. In addition, Watson et al (1991) identified technological status as a predominant factor that influences IS development.

Today's China is the remains of a 2000-year-old empire. Once the world's most powerful country economically and militarily, China closed its door for a long period of time until the late 1970s when the open door policy was implemented (Franklin, 1994). History has left a wealth of philosophies and beliefs that become obstacles to technological advancement today. People's attitudes toward computer uses are a main concern of IS proponents in China.

To better understand national cultures, Hofstede developed a framework of recognizing five dimensions of national culture: power distance, uncertainty avoidance, individualism versus collectivism, masculinity versus femininity, and long term versus short-term (1994).

Power distance refers to the degree of power inequality among people, more specifically, supervisors and subordinates (Shore, 1995). Chinese culture is high for this dimension (Paik, Vance, and Stage, 1996). This implies that the authority is more powerful. Moreover, recent studies conclude that Chinese organizations tend to be more hierarchical in nature because of the high degree of power distance. There has significant implication for the IS. IS structure is generally believed to be parallel with the organizational structure. If a Chinese firm was to implement a decentralized system, the firm would have to make major adjustments to its organizational structure to benefit from such system. The power structure and distance would then be greatly altered. We have to prepare the top management and the end-users for such a cultural transition.

Uncertainty avoidance refers to the extent to which people feel threatened by an uncertain circumstance and

avoid such situation by providing job security and establishing rigid rules (Shore, 1995). Traditionally, in a state-owned enterprise, employees are guaranteed life-time employment. Chinese culture is strong on this dimension. This is particularly critical when the majority of the firms are in the process of automating their business activities and processes. Some firms do not want to automate all the processes because first, manual labor is less expensive, and second, they do not want to create job insecurity.

Currently, China is going through an interesting restructuring and reeducation process to upgrade the level of labor skills. Particularly in state-owned companies, low-skilled workers will be offered voluntary early retirement opportunities along with a lump sum of money. The workers then are offered training from the government. Since there is a lack of skilled IS labor, it poses challenges for the company to retain valuable IS people.

Individualism refers to the degree that people focus on themselves as individuals rather than act as members of groups. The opposite is collectivism. In China, the society highly favors group activities. Individuals usually find groups who they can relate to for a long time. Usually, groups are formed in work settings. A high level of collectivism can work both for and against the implementation of IS.

Masculinity and femininity refer to values like assertiveness, performance, success and competition; the opposite of masculinity is femininity. Chinese culture leans more towards femininity. However, this dimension is moving to a more neutral status. The effect of this dimension on IS is yet to be determined (Shore, 1995).

The fifth dimension, long-term versus short-term orientation, was introduced in Hofstede's later study (1994). Chinese culture is long-term oriented. The implication for foreign investor would be that to be successful, they would expect to develop long lasting relationship with their Chinese partners.

The Chinese economy is growing steadily. Business growths, especially in the foreign invested sector, have directly affected the demand of information technology. China's population, composing almost a quarter of the world population, is ranked the largest in the world. Labor is a rich resource. One of the most common motivations of U.S. companies relocating labor intensive facilities to China is the low-cost labor. However, skilled labor is rare. In addition, many Chinese companies are reluctant to automate their business processes because labor is much cheaper than a computer system. Many times, the computer is only used to store data summarized

manually. The economic scale of computer use is still difficult to justify in some companies.

The buying power of the 1.2 billion people of China is constantly rising. As more and more companies in western countries find themselves in saturating domestic markets, they find tremendous business opportunities in this vast market. More interestingly, the population is young compared to western countries. The medium age is 27.6, estimated in 1995 (Facts, 1998). These phenomena implicate the world power and center shifts in the near future.

China's new government came into existence in 1949. It is a "unitary multinational republic" in which the Chinese Communist Party (CCP) dominates the political functions (Facts, 1998). CCP, founded in 1921 (Organization, 1998), is virtually the sole party because the minority parties function under the CCP. The National People's Congress, the most powerful body, is the central planning agent that establishes committees on law, finance, education, culture, foreign affairs, and economics (Facts, 1998). Not until 1982, did China adopt its constitution. The original constitution promoted the central planning role of the government. Public ownership was an integrated part of the economic system. The state economy was the leading force in the economy. The constitution was amended twice in 1988 and 1993. In 1988, the amendment marked the beginning of another economic era. For "complementary" purposes, the private sector economy was allowed to coexist with the state economy (Documents, 1998).

The Economic Information Joint Committee was established in 1993 to formulate policies for the development of a national information infrastructure. This marked the beginning of the development of information systems and technologies in China. Later the committee focused on Internet development. Since 1993, more favorable policies towards foreign investors resulted in the recent rapid growth in computer industry. By early 1998, foreign investment accounts for almost 50 percent of the new IT projects (China Daily, 1998).

The growing global importance of China can only be sustained if it stays technologically competitive. China has attracted significant foreign investment, \$133 billion in the mid-1990s (The Economist, 1997). Favorable business policies contributed to the proliferation of joint-venture and sole-foreign-ownership firms, which exposed China to advanced information technology. However, domestic companies must become more proactive in developing and utilizing advanced information technology.

IT development depends on the level of technological status. For example, Internet development depends on

telecommunications advancement. IT infrastructure is a major sector that has undergone tremendous construction. The telecommunications market is tightly controlled by The Ministry of Posts and Telecommunications (MPT) (Skillings, 1997)

China plans to install 123 million phone line by year 2000. Currently, foreign investors in the telecommunications market still face many hurdles. There are many parties involved in the process: government ministries, the provincial government, local posts, telecom authorities, equipment suppliers, and government agencies (Skillings, 1997).

Country Level CSFs

Based on the understanding of the factors that affect IT development, we propose a list of CSFs that is meaningful useful to guide future IT development. There are two stages to determining the CSFs. First a comprehensive literature review in the area of IS/IT development key issues and CSFs is conducted. Common thread found in the studies that are relevant to the context of IT development in China are the foundation of the CSFs. The second stage is to firm and refine the CSFs. Interviews with two executives from a predominant Chinese IT firm are conducted.

There has been a series of studies of key MIS issues in the U.S. (See Tractinsky, N; Jarvenpaa, S. L., 1995; Watson, Kelly, Galliers, and Brancheau, 1991; Brancheau, Janz, and Wetherbe, 1996; Badri, 1992; Ball and Harris, 1982; Brancheau and Wetherbe, 1996; Critical, 1995; Dickson, Leitheiser, Nechis, and Wetherbe, 1984; Niederman, Brancheau, and Wetherbe, 1991). Also, some global MIS key issues studies have been conducted (Deans, 1991; Palvia and Wang, 1995; Watson and Brancheau, 1991). Palvia, Palvia, and Zigli studied the key MIS issues in developing countries, which were even more relevant to this study (1992).

In addition, there are country-specific MIS key issues studies of Hong Kong (Burn, Saxena, Ma, and Cheung, 1993; Burn and Szeto, 1998), Canada (Carey, 1992), Slovenia (Deans, 1991), Estonia (Dexter, Janson, Kiudorf, and Laast, 1993), India (Palvia and Palvia, 1992), Singapore (Rao, Huff, and Davis, 1987), and the Republic of China (Harrison and Farn, 1990). Some of the issues of China can be adopted from those studies.

In the Pacific arena, many country-specific MIS-related researches have been conducted – the Republic of China, Hong Kong, and Singapore. There are several studies done on the Republic of China (Harrison and Farn, 1990). Hong Kong was the focus of many studies (Burn, Saxena, Ma, and Cheung, 1993; Burn and Szeto, 1998). Singapore was also a popular target of IS research (Lally,

1994), (11). Those studies are extremely relevant. Even some key IS issues of China may be similar or common to those of other countries, significant differences can be found among different countries (Deans, 1991; Tractinsky and Jarvenpaa, 1995; Watson, Kelly, Galliers, and Brancheau, 1991).

STONE is a leading computer company in China. One of the first private organizations, it was founded in 1981. The interviews took place in December 1997. One of the interviews was with the IS director at STONE. Another one is with the regional director in Beijing. At the time, Stone's IS department had just acquired a new computing facility. The facility drew attention from Beijing's TV station. The interviews were informative. Many of the issues reported by the literature review were confirmed. Some new perspectives surfaced. Again, we are presenting county-level factors.

1. Understanding/awareness of MIS contribution
2. IT infrastructure
3. MIS human resource. (Retaining, recruiting and training MIS/IT/DP personnel)
4. Information systems/technology planning
5. Government support
6. Technology transfer
7. Application software development
8. Software development and quality assurance standards
9. Telecommunications

(The discussion of the list is omitted to fit the paper within space limitation)

Implications and Conclusion

We identify the factors that have significant impact on IT development in China. Also, we propose a list of macro-level CSFs. Those factors have significant implications for policy makers, domestic companies, and foreign companies.

IT/IS development in China is Unique. It is at an early stage. It is also a complex issue. The study presented the driving factors of IT/IS development: culture, economic growth, political system, and technological status. Insensitivity to any factor may hinder the future development of IT in China. Recognition of those factors will help us formulate better IT policies and strategies. Finally, the CSFs proposed will serve as a checklist for IT planning at the country level.

References available upon request from En Mao.